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ABSTRACT

This testimony discusses ways in which some federal government agencies use technology to provide the public with cheaper, faster access to a wider range of information which can be searched and manipulated in ways never possible on the printed page. Technologies included in the discussion are compact disc-read only memory (CD-ROM), electronic bulletin board systems (BBSs), databases, voice messaging and facsimile transmission (FAX), microcomputers, floppy disks, computer networks, and online systems. Some databases from federal agencies that are available CD-ROM are discussed: the Geologic Long-Range Inclined Asdic (GLORIA)-East Coast from the U.S. Geological Survey; the Federal Acquisition Regulation (FAR) and the Federal Information Resources Management Regulation (FIRMR) from the General Services Administration; the Classification and Search Support Information System-Classification (CASSIS-CLSF) from the Patent and Trademark Office of the Department of Commerce; and the National Trade Data Bank from the Department of Commerce. Also discussed are a trial CD-ROM project at the National Agricultural Library; the Economic Bulletin Board of the Department of Commerce; Project HERMES, a pilot program which transmits Supreme Court decisions via personal computer and modem to subscribers; the use of voice messaging and facsimile transmission by the Office of Public Affairs at the Department of Agriculture (AgNewsFAX); and the Health Care Financing Administration (HSFA) Medicare pricing table, which has been issued on two floppy disks. Government Printing Office participation in such activities and the use of Internet to disseminate government information are also mentioned. Ordering information for technology examples is appended. (DB)

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INFORMATION DISSEMINATION

Innovative Ways Agencies Are Using Technology

Statement of
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Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss how some agencies are using technology to provide the public with cheaper, faster access to a wider range of information. These technological applications enable users to search and manipulate information in ways never possible on the printed page. As a result, users can create new information by selecting, combining, and arranging data within a matter of seconds.

The applications that I will discuss today were developed using compact disc-read only memory (CD-ROM), bulletin board systems, voice messaging/facsimile, and floppy disks. The information I will present is based primarily on interviews with users and developers of these applications and on a review of related documents. We did not independently verify the benefits or cost savings.

CD-ROM

It is widely believed that no information product has more potential for revolutionizing information access than CD-ROM data bases. CD-ROM is a digital data storage device that evolved from audio compact disc technology. A single CD-ROM can contain more than 600 megabytes of data, approximately 285,000 pages of text. For example, the entire 20-volume Academic American Encyclopedia takes up only 20 percent of one disc.

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CD-ROM users can search the equivalent of thousands of pages in seconds. Further, CD-ROM provides a much cheaper way of getting information to the public: the cost of producing and distributing one CD-ROM is only .024 cents a megabyte. In comparison, paper costs $4.00 per megabyte to print and distribute--over 166 times as expensive.

Unlike data on a floppy or hard disk, data on a CD-ROM cannot be erased or altered. This makes it an excellent technology for permanent storage. Data that are not time-sensitive or that require few updates are best suited to CD-ROM.

The latest version of the U.S. Geological Survey/Special Interest Group CD-ROM Applications and Technology Compendium lists almost 200 different CD-ROM discs containing government data. I will discuss four that highlight the diversity of this technology: the Geologic Long-Range Inclined Asdic (GLORIA)-East Coast from the U.S. Geological Survey, the National Trade Data Bank from the Department of Commerce, the Federal Acquisition Regulation (FAR) and the Federal Information Resources Management Regulation (FIRMR) from the General Services Administration (GSA), and the Classification and Search Support Information System-Classification (CASSIS-CLSF) from Commerce's Patent and Trademark Office.

GLORIA-East Coast, produced on CD-ROM by the Geological Survey in 1990, provides images of the bottom of the ocean, including detailed underwater geological features, sediment texture, and water depths. It comprises sonar-scanned data of the East Coast sea floor and data from the National Oceanic and Atmospheric Administration's Bathymetric Map Series.[1] GLORIA-East Coast combined this information for the first time; it has enabled researchers to use personal computers to analyze the data with a variety of software tools. One user stated that the CD-ROM saved hundreds of hours of processing time because the maps on disc are already digitized and no longer in paper form, making them ready to access. GLORIA-East Coast is available free of charge to all researchers.

The Department of Commerce's National Trade Data Bank is a comprehensive data set covering almost every aspect of U.S. trade and international economics. It contains information from 15 agencies, including the Departments of Commerce, Energy, Labor, and the Central Intelligence Agency. The National Trade Data Bank CD-ROM consolidates over 100,000 documents that would cost over $8,000 to purchase separately. With this CD-ROM, the public, the education community, and business can identify potential trading partners, spot trends, identify markets, or survey the economic and demographic conditions in over 250

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[1] Bathymetry is the measurement of depths of water in oceans, seas, and lakes.

countries. Each month, Commerce distributes 1,000 copies of the CD-ROM to regular subscribers, one-time buyers, and federal depository libraries. Discs may be purchased singly for $35 or through a $360 annual subscription that includes one disc a month.

GSA and the Government Printing Office have produced a CD-ROM containing the FAR and the FIRMR--governmentwide regulations on procurement, and on acquiring, managing, and using federal information processing resources. GSA's FAR/FIRMR CD-ROM helps agencies and private vendors follow federal guidelines on purchasing computer equipment. While the paper versions cost users $204 a year, GSA charges $106 a year for its CD-ROM and updates it quarterly. Each quarterly disc includes the latest changes reflected in the FIRMR transmittal and the federal acquisition circulars.

The Patent and Trademark Office has taken its on-line system, called CASSIS, and replaced it with three CD-ROM titles. One of the titles--CASSIS-CLSF--lists all patent numbers and their classifications. With this, a user can search and identify particular patent numbers, and determine whether an invention or innovation has already been patented. In fiscal year 1990, the Patent and Trademark Office saved at least $300,000 by replacing its on-line system with CD-ROM. Currently, 400 subscribers exist for all three CASSIS titles; in addition, each of the 80 patent

depository libraries receives a copy. Users include researchers, students, professors, lawyers, and business people. The Patent and Trademark Office charges $210 a year for CASSIS-CLSF and updates it every 2 months.

A trial project that has produced several CD-ROM titles is the National Agricultural Library Text Digitizing Project. In 1988, a cooperative project began between the National Agricultural Library and 42 land-grant university libraries. The project was designed to test scanning hardware and indexing/search software for capturing text and images in digital format.

So far, the National Agricultural Library has scanned information on aquaculture, international agriculture research, Agent Orange, and acid rain and has distributed it on separate CD-ROMs. In the next 6 months, the Library plans to issue three new CD-ROMs: a collection of research material from George Washington Carver, 18 volumes of the Journal of Agronomy, and information on water quality. The discs will be free of charge to land-grant libraries and agricultural researchers.

The Library has also sent digitized data between a library and other parts of a campus using a campus computer network, and between libraries. Recently, the Library has begun sending documents over Internet--a nationwide computer network--to 14

land-grant libraries. The pilot test is scheduled to end late this year.

BULLETIN BOARD SYSTEMS

A computer bulletin board system is the digital equivalent of the cork boards found in grocery stores: it provides a computerized means of posting messages or reading messages left by others. Computer users gain access to bulletin boards with a modem using telephone communication lines. Government agencies are beginning to use bulletin boards to disseminate time-sensitive and quickly changing information. Many government bulletin boards are free or have nominal subscription costs.

A bulletin board system offers advantages as an information dissemination mechanism. It enables users to have spontaneous access to the information 24 hours a day. For instance, someone in Los Angeles can access a bulletin board system in Washington, D.C., anytime of the day or night. In addition, data can be downloaded--transferred to the requesting computer--and altered.

Bulletin board systems also have limitations. Most contain only small amounts of data. Often the data on the screen are only ASCII text; graphics and other types of data usually cannot be found on a bulletin board. Because data can be manipulated, the

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data are not secure and should not be relied on for archival purposes.

One bulletin board system that demonstrates the potential of this technology's use for time-sensitive and quickly changing information is the Department of Commerce's Economic Bulletin Board. It offers time-sensitive economic indicators such as the gross national product, consumer price index, and personal income statistics. Twenty-four hours a day, users can get information ranging from current employment statistics to foreign currency rates. The files are continually updated and are available at or within a short time of their official release. The data come from several agencies, including the Treasury Department and the Bureaus of Census and Labor Statistics. Users may browse selected files as often as they like for free, but must subscribe in order to search the entire bulletin board and download the data. The subscription fee is $35 a year and from 5 cents to 20 cents a minute, depending on the time of the call. This bulletin board receives an average of 13,000 calls a month and has 32 telephone lines.

Some government information is available on Internet, the main computer network used by the U.S. research community. Internet is made up of more than 5,000 unclassified national, regional, local, and overseas networks. During our audit of the 1988 Internet computer virus, we came to appreciate Internet's

potential as a fast, effective means of distributing GAO reports. To gauge the interest of Internet users in obtaining our reports, in July 1989 we made our report on the Internet virus--Computer Security: Virus Highlights Need for Improved Internet Management (GAO/IMTEC-89-57, June 12, 1989)--available over three Internet bulletin boards. Internet users were given the option of retrieving the report electronically or using electronic mail to request a hard copy.

We found a large audience for our products within the Internet community. Since then we have used Internet to distribute ten additional GAO products on such topics as computer security, education, the Strategic Defense Initiative, and maternal and child health care. As of January 15, 1992, over 1,200 copies of our reports had been retrieved electronically. Our Office of Information Management and Communications is working on several technical issues that may enable us to move toward large-scale electronic report distribution.

Another example of electronic distribution is Project HERMES, a 2-year information-dissemination pilot project to transmit Supreme Court decisions electronically. The project uses a stand alone personal computer from which all decisions are transmitted to subscribers through a modem. Thirteen subscribers were chosen to participate in Project HERMES, including the Associated Press, the Government Printing Office, West Publishing, and the

Consortium of University Libraries. Subscribers pay a yearly fee of $500.

The pilot project ended last month. The Supreme Court will next decide whether to continue the project or try another approach. One option being considered is operating an electronic bulletin board.

VOICE MESSAGING/FACSIMILE

Facsimile is the transmission of printed information from one locale to another by encoding the printed material into digitized form and converting it back to its original form once it is received. Voice messaging, sometimes known as voice mail, automates spoken message delivery over a telephone network by using processed voice input and output and computerized routing and storage. Combined, these technologies allow users to call in on a telephone attached to a fax machine, listen to the selections on the telephone, make choices using the touchtone pad, and push the start button to have the information transmitted.

Combining voice messaging and facsimile gives users some benefits. Users can select just the information they need and immediately receive a paper copy of the information at any time

of the day or night. The cost to the user is generally only the phone call.

The Office of Public Affairs at the Department of Agriculture is using this technology to offer a free, 24-hour service called AgNewsFAX. It began in April 1990 and makes available a daily, monthly, or yearly list of news releases.

At this time, AgNewsFAX is getting 500 calls a week. The primary audience is news media but it is also available to the public. A sample listing of news releases from September 1991 included the world market price for upland cotton, an announcement of an end to the Mexican fruit fly quarantine from eight Texas counties, and notice of an Agriculture hearing on a proposed North Carolina tobacco market merger.

The Office of Public Affairs expects to recover the costs for the system in less than 2 years; after that, the system will produce a net annual savings to the taxpayers. In addition, it provides news releases instantly, instead of forcing users to wait 2 or 3 weeks for releases to be copied and mailed.

FLOPPY DISK

Floppy disks are small flexible disks that can store up to 1.4 megabytes of data. One benefit of the floppy disk is nearly

universal access: many people have access to personal computers at home, work, schools, or libraries. They are cheap, lightweight, and portable. Once data are on the disk, they can be manipulated using a word processing, spreadsheet, or data base software package. Disks can be used to distribute moderate amounts of information such as software, text, data bases, and data files to multiple users.

An example of information that can be manipulated using a spreadsheet and word processing package is the Health Care Financing Administration (HCFA) Medicare pricing table. HCFA and the Government Printing Office have taken the 146-page Medicare pricing table and issued it on two floppy disks to make it easier for users to access. The floppy disks contain the final rule for the Medicare fee schedule, which was originally printed in the Federal Register. The disks will be used primarily by physicians and medical billing offices and include text in WordPerfect version 5.1 format, Lotus 123 worksheets, and an ASCII text help file. The floppy disks and the Federal Register hard copy cost $44.

The Lotus worksheets and table on the floppy disks enable users to manipulate data much more easily than with hard copy. They can use the worksheets to determine prices or use search tools to find particular information.

GAO is currently developing an electronic audit guide on floppy disk. This guide will summarize a methodology for assessing information technology purchases at different stages of development. The expected audience includes inspector general officials and other auditors who review federal efforts to acquire and implement information technology resources. So far, we have developed and tested a prototype version of the audit guide. The prototype allows instant access to materials--including procurement regulations and Office of Management and Budget directives--by simply selecting key words. This will give auditors not only a guide, but also all the regulations and directives needed for the audit.

In summary, the technologies discussed today have made it easier to obtain information and have the potential for cheap, fast, and effective public access to a wide range of government information. What we have seen is encouraging and presents opportunities that should be further promoted and explored. We have enclosed an attachment that lists the names and telephone numbers of sources for more information on the examples discussed.

This concludes my statement. I would be glad to respond to your questions.

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ATTACHMENT ATTACHMENT

ORDERING INFORMATION FOR TECHNOLOGY EXAMPLES

TITLE	POINT OF CONTACT	COST
GLORIA-East Coast Topic: Oceanic Data	U.S. Geological Survey 703-648-6525	Free to researchers
National Trade Data Bank Topic: Trade and Export Information	Department of Commerce 202-377-1986	$35 for one disc or $360 for an annual monthly subscription
FAR/FIRMR CD-ROM Topic: Acquisition Regulations	Government Printing Office 202-783-3238	$106 for an annual quarterly subscription
CASSIS Topic: Patent Information	Patent and Trademark Office 703-305-9154	$210 for an annual quarterly subscription
Economic Bulletin Board Topic: Economic Information	Department of Commerce Voice: 202-377-1986 Data: 202-377-3870	$35 for an annual subscription plus 5 cents to 20 cents a minute
AgNewsFAX Topic: Agriculture News Releases and Fact Sheets	Department of Agriculture Voice: 202-720-4026 AgNewsFAX: 202-690-3944	Free
HCFA Medicare Disk Topic: Medicare Pricing Table	Government Printing Office 202-783-3238	$44 for disk and hard copy

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